



# Voiding patterns of adult patients who underwent hypospadias repair in childhood

Jawdat Jaber, Stanislav Kocherov, Leonid Chertin, Amicur Farkas, Boris Chertin

Department of Pediatric Urology, Shaare Zedek Medical Center, Faculty of Medical Science, Hebrew University, Jerusalem, Israel

Correspondence to: B. Chertin, Department of Pediatric Urology, Shaare Zedek Medical Center, Jerusalem, 91031, P.O.B 3235, Israel

[boris.chertin@gmail.com](mailto:boris.chertin@gmail.com)  
(B. Chertin)

## Keywords

Hypospadias repair; Voiding pattern; Long-term follow-up

Received 2 February 2016  
Accepted 1 August 2016  
Available online 5 October 2016

## Summary

### Objective

This study aimed at evaluating the voiding patterns of adult patients who underwent hypospadias repair in childhood.

### Method

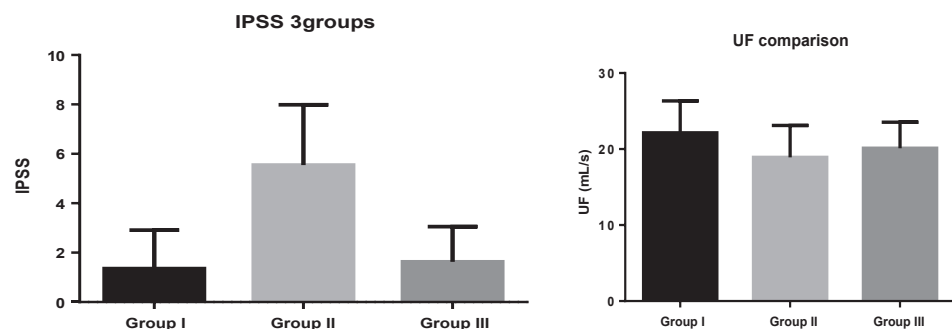
Following IRB approval 103 (22.7%) of 449 adult patients who underwent hypospadias repair between 1978 and 1993 responded to the following questionnaires: International Prostate Symptom Score (I-PSS) and Short Form 12 questionnaire (SF-12). Uroflowmetry (UF) was performed for all patients. The patients were divided into three groups according to the primary meatus localization. Group I had 63 patients (61.5%) treated for glanular hypospadias, group II had 19 patients (18.4%) treated for distal hypospadias, and group III comprised the remaining 21 patients (20.4%) treated for proximal hypospadias.

## Results

The mean  $\pm$  SD I-PSS score for all patients who responded to the questionnaire was  $2.3 \pm 2.4$ , and UF was  $21.1 \pm 4.3$  mL/s. The patients from groups I and III had fewer urinary symptoms compared with those of the group II:  $1.3 \pm 1.5$ ,  $5.5 \pm 2.4$ , and  $1.6 \pm 1.4$ , respectively ( $p < 0.0001$ ). With regards to UF, the patients from the groups I and III did better compared with those from the group II:  $22.1 \pm 4.1$  mL/s,  $18.91 \pm 4.2$  mL/s, and  $20.11 \pm 3.42$  mL/s, respectively ( $p = 0.021$ ) (Figure). The UF was better in patients with normal vs. abnormal IPSS ( $p = 0.0064$ ). The physical component summary was  $49.8 \pm 10.3$ ,  $51.1 \pm 3.6$ , and  $46.4 \pm 0.3$  in groups I, II, and III, respectively. The mental summary component was  $42.64 \pm 4.1$ ,  $42.2 \pm 2.4$ , and  $39.89 \pm 2.9$  in groups I, II, and III, respectively.

## Conclusions

Most of the adult patients who underwent hypospadias repair in childhood had normal or mild voiding disturbance, with no effects on their physical or mental status.



**Figure** IPSS scores and UF in the study groups. Group I: glanular hypospadias, group II: distal hypospadias, group III: proximal hypospadias.

## Introduction

Many surgical procedures have been suggested for repair of hypospadias [1–9], resulting in a significant number of scientific papers published discussing short-term functionality and incidence of early problems such as urethral strictures and fistulae following hypospadias repair [1,5–7]. However, surprisingly scant attention has been paid to the long-term results of hypospadias repair and the influences on patients' subsequent voiding patterns. Issues with voiding pattern are often raised by concerned parents of children with pediatric hypospadias upon penile reconstruction [10–14]. As the child grows into adulthood, voiding function becomes an important issue.

Not surprisingly, data concerning these questions are scant and difficult to assess, as most pediatric urologists do not follow their patients well into adulthood. Furthermore, most "adult urologists" see only those patients who complain of problems, and may be led to believe that voiding difficulties in hypospadias patients are more common than they actually are. An additional confounding factor is that most reports in the literature concerning the long-term results of hypospadias surgery in general, are based on patients who were operated on decades ago using reconstructive techniques that today would be considered outdated. Thus, these reports do not give us the answers we need to dependably predict the long-term voiding pattern of currently utilized surgical techniques. Recently, we published data concerning the resulting sexual function following hypospadias surgery [10]. For the present study, we aimed at evaluating the voiding pattern of adult patients who underwent hypospadias repair in their childhood, utilizing standardized outcome measures for voiding pattern. Such evaluation could benefit surgeons by providing information on the functional outcomes of their surgeries, and benefit patients and their parents by providing a better understanding of the long-term effects of hypospadias repair.

## Patients and methods

Following IRB approval, we reviewed the medical files of all patients who underwent primary hypospadias repair at our department. We have previously reported our regimen for surgical management and outcome in primary hypospadias patients who underwent surgical repair in our department over the last three decades [9,15]. Our surgical protocol had slightly changed over the years; in brief, all patients were allocated for surgery after the age of 6 months. Hormonal supplementation was given to those with a small phallus, as we have previously reported. All hypospadias repairs were done on an outpatient procedure basis, utilizing loupe magnification in 87% of all cases. Silastic stents were left in all patients for periods of time ranging between 24 h and 6–7 days, according to the type of the repair and primary meatus localization. All patients had one routine follow-up, 6 months and 1 year, after the surgery.

After that, those who had no complications were advised to return to the clinic at age 12–13 years and at age 18 years on completion of the adolescence period or prior to

recruitment to the army, unless they had urological problems or dissatisfaction with the outcome of surgery.

We reviewed the hospital and office charts of studied patients, noting the following: patient age at surgery, location of meatus, type of hypospadias repair, presence of chordee, operating surgeon, and complication rates. Complications included surgery breakdown, fistula ratio, meatal stenosis, and need for reoperation. Complication rates were divided into immediate, referring to all complications within the first 6 months of follow-up, and late, referring to complications developed after 6 months of follow-up.

In total, there were 449 adult patients who underwent primary hypospadias repair as children between 1978 and 1993, and had reached the age of 18 at study initiation. Patients who had at least 1 year follow-up after primary repair were asked to complete the International Prostate Symptom Score (I-PSS) and Short Form 12 (SF-12) questionnaires.

The International Prostate Symptom Score is based on the answers to seven questions concerning urinary symptoms and one question concerning quality of life. Each question concerning urinary symptoms allows the patient to choose one answer from six potential answers indicating increasing severity of the particular symptom. The answers are assigned points from 0 to 5. The total score for urinary symptoms can therefore range from 0 to 35 (asymptomatic to very symptomatic). The questions cover the following urinary symptoms: 1. incomplete emptying, 2. frequency, 3. intermittency, 4. urgency, 5. weak stream, 6. straining, and 7. nocturia. Question 8 refers to the patient's perceived quality of life.

The SF-12 questionnaire aims to ascertain the mental and physical status of patients at the time of study. We suggested that all patients should perform uroflowmetry (UF) regardless of their clinical status. The UF was done with minimal voiding volume of 150 cc and a mean maximum flow rate less than 18 mL/s was considered to be pathological.

Commercially available software GraphPad Prism version 5.00 for Windows (GraphPad software, San Diego, CA, USA), chi-square and Fisher tests were used for statistical evaluation, considering a *p* value of <0.05 to be significant.

## Results

Of the 449 patients, 103 patients (22.7%) with a median age of 25 years (range 18–32 years) responded to the distributed questionnaires. Patients were divided into three groups according to the primary meatus localization [16]. Group I included 63 patients (61.5%) with glanular hypospadias, group II consisted of 19 patients (18.4%) with distal hypospadias, and group III the remaining 21 patients (20.4%) with proximal hypospadias. The mean age  $\pm$  SD of the patients at surgery was  $2.7 \pm 3.9$  years. A fellowship-trained pediatric urologist performed 69% of the operations, with the remainder performed either by an adult urologist or senior resident under the supervision of one of the senior doctors. Sixty-four patients (14.2%) required corporoplasty to straighten the penis. In the remaining patients, penile skin degloving was sufficient to fix chordee.

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